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CONGRESS, Session. | SENATE. | DOCUMENT No. 1105.

RECOVERY OF GOVERNMENT WASTE PAPER.

MESSAGE

FROM THE

PRESIDENT OF THE UNITED STATES,

SUBMITTING,

IN RESPONSE TO SENATE RESOLUTION OF FEBRUARY 21, 1913, ADDITIONAL INFORMATION RELATIVE TO THE SAVING IN RECOVERY OF GOVERNMENT WASTE PAPER.

FEBRUARY 24, 1913.—Read, referred to the Committee on Appropriations, and ordered to be printed.

To the Senate:

In response to the resolution of the Senate dated February 21, 1913, requesting that I send to the Senate any additional information submitted by the Commission on Economy and Efficiency relating to the matter of saving in recovery of Government waste paper, I transmit herewith reports of the commission on the subject dated September 21, 1912, and February 11, 1913.

WM. H. TAFT.

THE WHITE HOUSE, *February 24, 1913.*

REPORT ON THE COLLECTION, HANDLING, AND DISPOSITION OF WASTE PAPER IN THE GOVERNMENT SERVICE.

Submitted by the President's Commission on Economy and Efficiency.

FEBRUARY 11, 1913.

THE PRESIDENT:

The Commission on Economy and Efficiency has the honor to submit the following report in reference to the collection, handling, and disposition of waste paper in the Government service. Based upon the result of its investigation, the commission has developed three plans, any one of which, if followed, would bring an increased revenue over that derived under the present practice. These three plans are briefly as follows:

1. That all the waste paper in the Government service be accumulated at one central station (preferably under the control of the Government Printing Office) and

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there assorted into various grades, and that bids be asked for by grades rather than by departments. Under this plan the estimated increase of net proceeds over present plan would be $27,844.38 per annum.

2. That a pulping plant and wet press be installed at this central station and pulp made up in wet sheets of various grades and that bids be asked for on the wet sheets by grades. Under this plan the estimated increase of net proceeds over the present plan would be $31,273.27 per annum.

3. That a Government plant be installed for the purpose of making paper from this waste. Under this plan the estimated increase of net proceeds over the present plan would be $105,712.76 per annum.

The commission recommends that the first plan be adopted for the fiscal year beginning July 1, 1913, and that during that year the second and third plans be given further consideration.

PRESENT METHOD OF COLLECTING, HANDLING, AND DISPOSING OF WASTE PAPER.

The methods of collecting waste paper in the various departments are almost as numerous as there are departments. In some bureaus the messenger force picks up waste paper; in other bureaus the waste paper is picked up by the char force; in some bureaus laborers do the collecting. This is also true of the handling. In some bureaus the paper is baled, while in others it is put in storerooms in burlap bags and those filled bags carted away by contractors. In some bureaus the waste paper is assorted, while in others no assorting is done. The method of disposing of waste paper also differs in various bureaus and departments. Some bureaus sell their waste paper in an assorted state, others in an unassorted state; some bureaus and departments destroy their waste paper (the reason for so doing being the confidential nature of the matter printed or written thereon); other bureaus, being in rented buildings, permit the owners of rented buildings through their employees to collect, handle, and dispose of all waste paper, the revenue (if any) being kept by owners of the buildings.

Proposals for bids for the sale of waste paper are asked for by the departments separately, and in many cases the prices for the same kinds of paper vary in amount although purchased by the same contractor. The prices paid for waste paper for the fiscal year 1912, in most cases, were less than those of previous years.

A table is attached hereto giving the estimated annual quantities, estimated costs of collecting and handling, estimated square feet of storage space occupied, contractor's price for year 1912, the method of disposition, and the estimated revenue for fiscal year 1912. This table is marked "Exhibit A."

The three plans mentioned on the first page of this report are described as follows:

FIRST PLAN.

There is now collected throughout the Government service about 5,712.55 net tons of waste paper annually, 77.65 tons of which are at present disposed of by either burning, dumping, or giving away. The balance, or 5,634.90 tons, is sold. Of this amount, 2,635.57 tons are sold in an unassorted state (by "unassorted state" is meant sold as "waste paper" after assorting a few special grades, or sold as "waste paper" without assorting of any kind) and the balance, or 2,999.33 tons, is sold in an assorted state.

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It is estimated that if the waste paper now sold as unassorted were to be assorted the following grades and percentages would result:

Grades.	Per cent.	Net tons.
Ledger and bond	15	395.34
Book (Government publications)	20	327.10
Manila No. 1	10	263.56
Manila No. 2	10	263.56
News	5	131.77
Strawboard	10	363.56
Cardboard	15	395.34
Magazines	15	395.34
	100	2,635.57

For the 77.65 tons now disposed of by burning, dumping, or giving away, if sold as recommended the same percentages would apply, or:

Grades.	Per cent.	Net tons.
Ledger and bond	15	11.65
Book (Government publications)	20	15.53
Manila No. 1	10	7.75
Manila No. 2	10	7.76
News	5	3.89
Strawboard	10	7.76
Cardboard	15	11.65
Magazines	15	11.65
	100	77.65

The average prices per ton quoted on this stock by the New York Paper Trade Journal for the six months ended July 1, 1912, were as follows:

Ledger and bond	$31.60
Book	19.60
Manila No. 1	13.00
Manila No. 2	8.60
News	7.20
Strawboard	6.00
Cardboard	6.00
Magazines	10.60

It is recommended that all the waste paper of the Government service be collected by automobile truck service, under the supervision of the Public Printer, and brought to the building occupied by the Government Printing Office, and there assorted and sold under separate contracts for grades of paper, rather than by separate contracts for separate departments. The reason for recommending that the Government Printing Office be the central collection station is that the Government Printing Office now has close to 50 per cent of the Government waste paper and therefore only about 50 per cent would have to be rehandled rather than the whole.

It is estimated that the cost of assorting would amount to about $1.25 per ton. The cost of collecting (using two auto trucks and two men, although it is thought that one truck and one man are sufficient) would amount to about $3,000. This $3,000 is estimated to include the cost of repairs, depreciation, etc., of trucks.

As the New York Paper Trade Journal quotes prices for New York City, and as the mills using waste paper are not situated in the city of New York, the difference in freight rates between Washington and mill points and New York City and mill points should be taken into consideration. The difference in freight rates on waste

paper averages about $1 per ton. As there are about 5,712.55 tons the difference in freight rates amounts to $5,712.55.

There are 2,713.22 tons of waste paper per year now unassorted or destroyed. As this would have to be assorted prior to selling, the cost of such assorting would amount to $3,391.53.

As a large part of the waste paper now sold in an unassorted state is baled by small hand balers and some by the old-fashioned power balers it is estimated that the cost of baling the entire quantity of waste paper would not be as great as the present cost if up-to-date hydraulic presses were used.

The total present revenue from the disposition of the unassorted waste paper amounts to $10,291.30. Under the proposed plan, the revenue from this paper would amount to $38,717.90, as shown by the following table, No. 1:

TABLE NO. 1.

Grades.	Tons unassorted.	Tons destroyed.	Total.	Price per ton.	Amount.
Ledger and bond	395.34	11.65	406.99	$31.60	$12,860.88
Book	527.10	15.53	542.63	19.60	10,635.74
Manila No. 1	263.56	7.76	271.32	13.00	3,527.16
Manila No. 2	263.56	7.76	271.32	8.60	2,333.35
News	131.77	3.89	135.66	7.20	976.82
Strawboard	263.56	7.76	271.32	6.00	1,627.92
Cardboard	395.34	11.65	406.99	6.00	2,441.94
Magazine	395.34	11.65	406.99	10.60	4,314.09
Total	2,635.57	77.65	2,713.22	.....	38,717.90
Present revenue from sale of this paper	.....	.....	.....	.....	10,291.30
Estimated increased revenue	.....	.....	.....	.....	28,426.60

The waste paper now assorted, if bringing the prices shown by the average for the six months ending July 1, 1912, of the New York Paper Trade Journal, would produce a revenue of $63,758.51 as compared with $52,236.65, the amount received under the present method. The details are shown in Table No. 2.

TABLE NO. 2.

Present name of grade.	Grade according to paper trade.	Estimated annual quantity, net tons.	Price per ton as quoted by New York Paper Trade Journal.	Estimated net returns.
Money-order checks (blue safety)	High-grade printed writings	336.84	$22.00	$7,410.48
Internal-revenue stub books, colored writings.	Colored writings (printed blanks)	308.15	15.00	4,622.15
Pressboard	Straw and box boards	18.95	6.00	113.70
Straw and tar boards	.....do	11.91	6.00	71.46
Shavings from blanks	No. 1 hard white shavings	76.36	45.00	3,436.20
White book shavings	No. 1 soft white	357.67	36.00	12,876.12
Monotype keyboard	No. 1 manilas	30.90	33.00	1,019.70
Book shavings mixed	Shavings No. 1 mixed	462.65	17.00	7,865.05
Imperfections from printed papers.	No. 1 crumpled sheet stock	930.92	22.00	20,480.24
Manila clippings	Extra new manila clippings	36.46	28.00	1,020.88
Brown wrapping	Bogus and mill wrappers	97.74	10.00	977.40
Strawboard cuttings	Strawboard cuttings	193.73	8.00	1,549.84
Discarded publications	No. 1 book, heavy	60.07	17.00	1,021.19
Book paper	.....do	74.90	17.00	1,273.30
Registered package envelopes	No. 2 old manilas	2.08	10.00	20.80
		2,999.33	.....	63,758.51
Present revenue		.....	.....	52,236.65
Estimated increased revenue		.....	.....	11,521.86

The total increased revenue, as shown by Tables Nos. 1 and 2, would amount to $39,948.46 From this should be deducted:

Cost of collection by motor trucks (not now performed by departments)	$3,000.00
Difference in freight rates	5,712.55
Cost of assorting 2,713.22 tons, at $1.25 per ton	3,391.53
	[1] 12,104.08
Net increased proceeds	27,844.38

The foregoing figures showing comparison of revenues and proceeds do not take into consideration the costs of collecting and handling waste paper. These costs under the present plan, as shown in Exhibit A amount to $32,742.43. The costs of collection and handling under plan proposed in the foregoing will not be affected, therefore it is thought unnecessary to bring them into the calculations wherein comparisons under the two plans are made.

SECOND PLAN.

An application has recently been filed in the Patent Office for a patent on a deinking and defibering machine, and process, and allowance thereof has been made. This machine and process is for the purpose of reducing paper to a pulp, separating the ink that appeared on paper from the fibers, also separating the fibers. Paper mills now manufacturing paper from old stock (or waste paper) do exactly the same thing, but their methods are cumbersome and expensive as compared with the simple arrangement of the method of this newly invented machine and process.

A working model of this machine was tested by a committee on waste paper representing this commission, consisting of an expert from the Bureau of Standards and two representatives from the commission. The machine did all that was claimed for it, and is thought to be a great improvement over all other known processes of producing pulp from waste paper.

The following is a report made by the expert from the Bureau of Standards who was detailed as a member of the committee on waste paper covering matters connected with the recovery of old papers:

The Recovery of Old Papers.

At the present time there are three general methods in use for the recovery of old paper stock. One of these methods is comparatively new, while the two other methods are more or less a modification of methods in use for a considerable number of years.

These three methods are known as follows: Cooking in closed tanks or boilers, cooking in open tanks or kettles, and cooking in inclosed-engine cookers. The last-named method is the more modern, while the first two are very much older methods.

The general practice for the preliminary handling of old papers is substantially the same for all of the various cooking methods and consists in sorting the old papers by hand into the grades desired and at the same time removing all undesired grades, together with any pieces of rubber, wood, or metal, etc., as may be contained therein. After sorting, the paper is run through dusting machines that thrash the papers around, in order to remove all dirt and dust, which is sucked away by suction fans. The papers are somewhat torn and shredded in this dusting process, and in some mills they are still further torn apart by passing through a shredding machine which reduces them to sizes varying from 3 to 10 inches square.

[1] The paper now destroyed because of the confidential nature of memoranda thereon should be put through a shredder, destroying confidential notations, and sold with the paper not so shredded. The cost of shredding is a very small consideration.

COOKING BY CLOSED-TANK METHOD.

The old papers after handling, as previously noted, are run into large rotary boilers, together with milk of lime, and soda ash or caustic soda, depending on the particular mill practice, and after closing the boiler, live steam is introduced to a pressure of from 10 to 50 pounds, equal to a temperature of from 240° to 300° F., and the boiler is rotated. This cooking process is carried on from 8 to 16 hours, at the end of which time the pressure is relieved and the contents dumped into box trucks and run into washing engines, where the stock is defibered by the action of the beater roll, and the ink and dirt are removed by one or more cylinder washers. This washing process requires from 4 to 8 hours, depending upon the number of cylinder washers. After washing, the stock must be bleached with a chloride of lime solution and then run into draining vats, where the stock drains, and after rewashing by the introduction of water to free the stock from any remaining bleach the stock is ready to be put into beaters preparatory to remaking into paper. This draining process requires from four days to two weeks. The length of time required to drain is due to the necessity of removing any bleach that may remain, as bleach has an injurious effect on finished paper. The loss of fiber due to this process is from 25 to 50 per cent, depending on the care with which the operation is carried on and the quality of papers used.

COOKING BY THE OPEN-KETTLE PROCESS.

The principal difference between this method as compared with the closed-tank method is that the old papers are cooked in open tanks at atmospheric pressure equal to 212° F., and a solution of soda ash is used. The cooking operation is carried on from 10 to 16 hours, at the end of which time the stock is washed, bleached, and run into drainers, as in the first method described, with the same time requirements. The loss of fiber due to this process is from 20 to 40 per cent and is less than the first method, due to a decrease in both temperature and pressure, as well as a decrease in strength of chemicals used.

COOKING BY THE INCLOSED-ENGINE PROCESS.

In this process the old papers are cooked direct in a beating engine, fitted with a steam-tight cover, at a pressure of 5 pounds, equal to a temperature of 228° F. Soda ash is the chemical used to soften the paper and to form an emulsion with the fats of the ink. This method of cooking and defibering requires about four hours, at the end of which time the pulp is run into washing engines, where it is washed in from two to six hours, and, after bleaching, is run to drainers, as in the previous methods. The loss of fiber by this process is from 20 to 40 per cent, but the time saved is from 4 to 12 hours over either of the two previous methods.

It is a very well-known fact that any fibers that go to make up a sheet of paper may be very seriously injured by the action of high temperature, causing a weakening in the fiber and an actual loss in weight, due to fiber decomposition. In other words, an increase in temperature results in an increased fiber loss. In order to get the best results from recovering old papers, the process must be carried on at the lowest temperature with the weakest chemicals and with as little mechanical action as possible. In addition to these three requirements, the consideration of time required is also an important item. Any process which does not require the pulp to be bleached after washing is a saving in machinery, labor, time, chemicals, power, and space, and also a saving in fiber loss, as any bleaching solution is injurious to all paper fibers.

The new process for the recovery of old papers, as invented by Mr. O. C. Winestock, of Perkinsville, Vt., was very carefully inspected, and several runs were made.

The method of making each demonstration was as follows: Fifteen pounds of paper were weighed out and soaked in hot water (about 110° F.) for a few minutes; the wet stock was then fed to the machine. After filling the machine with the required amount of hot water at from 160° to 170° F., the wet paper pulp and chemicals were added, the machine run until a sample drawn from the machine showed no small particles of paper not entirely defibered. The time required for this machine to reduce paper to a mass of individual fibers suspended in water and to separate the ink from the fiber, varied from 2 to 15 minutes, depending on the characteristics of the paper used.

The pulp, after being reduced in the machine, was run into a single-cylinder washer, where it remained for from one to three hours, when it was thoroughly washed free of any ink particles.

The pulp, after washing, is then ready for the paper-machine beater and does not require any bleaching whatever, nor does it require the addition of any new stock.

The estimated fiber loss is from 10 to 20 per cent, depending on quality of the stock, percentage of ash, and size.

The pulp was very carefully examined under the microscope to see if any particles of carbon remained; practically none were found. The fibers show no signs of injury either in regard to shortening or bruising, nor were the fine frayed-out ends of a well-beaten rag fiber destroyed. Any loss of fiber due to this process must come as a result of fiber passing through the wire of the cylinder washer. The operating temperature is too low to cause any appreciable fiber decomposition, also the chemicals used are too weak, and the mechanical action is such that there is very little or no loss from these causes.

Three kinds of paper were used for the demonstrations "printed news," "printed Congressional Record," and printed "supply schedules" of the General Supply Committee. These three grades were selected for the reason that they include a wide range in grades, the "news" being 75 per cent ground wood and 25 per cent unbleached sulphite, the "Congressional Record" containing 100 per cent bleached sulphite, highly sized and calendered, and the "supply schedules" containing 90 per cent rag and 10 per cent bleached sulphite pulp. The following table shows the time required for handling each of the three lots of paper:

	Started to fill at—	Finished filling at—	Chemicals in at—	End of run at—	Total time in minutes.	Time in minutes required to separate ink.
News	12.04.5	12.11.5	12.12.5	12.15.0	10.5	3.5
Congressional Record	3.28.5	3.44.5	3.45.5	3.52.5	24.0	8.0
General Supply Committee schedules	2.02.5	2.06.5	2.07.0	2.11.0	8.5	4.5

The lots of paper used were all more or less colored with coloring matter, it being necessary to use some blue and red coloring in order to get a white sheet of paper. This coloring matter was, of course, washed out during the process, along with ink, size, and filler, so that the color of the recovered stock was not an absolute match with the paper before going through the process, but there is no doubt that had the pulp been made back into paper, under the same conditions as when originally made, the resulting paper would have been an exact match. Any paper maker will readily understand this point and appreciate its full value.

It is a well-known fact that in recovering books and higher grade stock, the presence of any paper containing ground wood is shown by the paper turning a very dark-brown color, which can not be bleached out, and this paper tends to lower the value of the whole batch of recovered stock. The Winestock process absolutely does not discolor papers containing ground-wood pulp, thus making this process available for recovering old newspaper.

The machine is of such design that it could very readily be made in larger sizes—say, for example, one handling a charge of 500 pounds of old papers. The time of handling such sized charges would not be increased very materially, besides such sized machines would cut down labor, floor space, etc.

To sum up and compare this new process with the three processes, as previously described, shows the following advantages in favor of the new process: A great reduction in time required to recover, decrease in floor space, power, labor, and chemicals, a very much lower working temperature, and no bleaching or new stock required. Considering all these points, the fact of increased fiber yield becomes self-evident.

It is recommended that this process be installed for the purpose of converting the waste paper now sold as such into a wet stock called by the trade "wet sheets," and sold as such.

All papers must be subjected to a recovery process for the purpose of defibering or deinking, or both, before the paper stock becomes available for remanufacture into paper. For this reason it becomes necessary to divide the Government waste paper into two general classes, viz, those papers available for remanufacturing into white or colored papers, and the remaining papers that are only available for remanufacturing into "wrappings," "boxboards," etc.

The first general class may be still further subdivided into the following grades:

No. 1 white bond and ledger shavings.
No. 1 soft white shavings.
Colored writings.
Printed writings.
Book.

Under this subdivision, the following tonnage is available for remanufacturing into high-grade white and colored "papers."

	Tons.
No. 1 white bond and ledger shavings	76.36
No. 1 soft white shavings	357.67
Colored writings (rag)	308.15
Printed and used writings	743.83
Book	2,478.16

The balance, 1,748.38 tons, could go into a grade of remanufactured wrapping papers. It would be more advantageous to take this or most of this paper now in shape of wrapping paper, and assort for good pieces to be reused as wrapping and sold only as waste paper when unfit for reuse. This paper, when unfit for reuse as wrappers, may be reduced to pulp, but it is better not to have so great a difference in the grades at this pulping plant because this wrapping paper is a much inferior grade to the 3,964.17 tons before mentioned. It is suggested that this paper be sold as recommended under plan No. 1.

The cost of reducing this 3,964.17 tons by the Winestock process into wet sheets ready for shipment to and use by paper mills would be about $9 per ton. This figure has been computed by the expert from the Bureau of Standards, one of the members on the joint committee on waste paper, who has had practical experience in paper mills and is familiar with the Winestock process.

This $9 per ton includes estimated depreciation on plant and interest on investment.

The following table gives the estimated costs in connection with the pulping and other handling of this 3,964.17 tons:

3,964 tons of pulp, at $9 per ton		$35,677.53
3,964 tons (present cost of collections, and other handling)		22,722.64
Motor truck maintained, etc., as per plan No. 1		3,000.00
Assorting 1,356.61 tons, at $1.25 per ton		1,695.76
		63,095.93
In order that this pulp stock may be delivered in the best condition to paper manufacturers, it is necessary to leave with the pulp in shipping a quantity of water or moisture about equal in weight to the pulp stock. Except for the loss of material due to the process of reducing to pulp which amounts to about 15 per cent of the original quantity of waste paper, the shipping weight of this pulp would be twice the weight of the waste. Therefore the average cost of transportation at $2.40 per ton would be		16,173.79

Illustrated as follows:	Tons.	
Original weight of waste	3,964.17	
Loss through pulping process, 15 per cent	594.63	
Weight of pulp stock	3,369.54	
Weight of water or moisture	3,369.54	
Shipping weight	6,739.08	
Freight cost, at $2.40 per ton		$16,173.79
Total costs		79,269.72

The table following gives the estimated revenues from the sale of these wet sheets:

TABLE No. 3.

	Tons.	Net tons recovered at 85 per cent yield.	Estimated sales price.	Estimated gross revenue.
No. 1 shavings, white bond and ledger	76.36	64.90	$60.00	$3,894.00
No. 1 shavings, white, soft	357.67	304.02	50.00	15,201.00
Colored rag writings	308.15	261.94	25.00	6,548.50
Printing and used writings	743.83	632.25	44.00	27,819.00
Book papers	2,478.16	2,106.43	40.00	84,257.20
Total	3,964.17	3,369.54	.....	137,719.70

The 1,748.38 tons would bring, if sold as per plan No. 1		$15,680.97
The costs connected with the collection, handling, etc., are as follows:		
Present cost of collecting, handling, etc	$10,019.79	
To assort 1,356.61 tons out of the above-mentioned total, at $1.25 per ton (sold now "unassorted")	1,695.76	
Difference in freight rates as described in plan No. 1	1,356.61	
		13,072.16
Net revenue from 1,748.38 tons		2,608.81
Gross revenue from 3,964.17	137,719.70	
Total expense costs	79,269.72	
Net revenue from 3,964.17 tons		58,449.98
Net proceeds under plan No. 2		61,058.79

The net proceeds of $61,058.79 shown under the above plan contemplates no change in cost of collecting and handling as compared with the present plan. These costs under the present plan as shown by Exhibit A are $32,742.43 against a revenue of $62,527.95, leaving net proceeds of $29,785.52 annually. The increased proceeds under plan No. 2 over the present plan, therefore, would amount to $31,273.27 annually.

The estimated cost of installing a pulping plant would be about $75,000. This amount would cover all possible contingencies.

THIRD PLAN.

In plan 3 it is thought that, as both plans No. 1 and No. 2 contemplate the selling of either the waste paper as such or the wet sheets as such to paper mills the shipping expense would be a large item, together with the numerous handlings of same, it would be better to remanufacture the waste into new paper in a Government-owned plant. This paper could be used exclusively by the Government Printing Office, as that office is the largest buyer of paper in the Government service. It is believed that of all the plans described this plan should be followed, owing to the fact that the most favorable conditions would result therefrom.

The figures given throughout this plan are those compiled by the same representative of the Bureau of Standards as mentioned in Plan No. 2.

The 3,964.17 tons of the one class of paper mentioned in plan No 2 would reproduce 3,369.54 tons. This would be divided as follows:

Under Government Printing Office schedule.	Tons.	Prices per ton paid by Government Printing Office corresponding to each item.	Value.
Items 46 to 41	64.90	$100.00	$6,490.00
Items 22*b* to 25*b*	304.62	90.00	27,361.80
Items 44 to 45	261.94	80.00	20,955.20
White and colored writings	632.25	90.00	56,902.50
Book	2,106.43	80.00	168,514.40
Total	3,369.54		280,223.90

The cost of manufacturing other than the cost of pulping as shown in plan No. 2 amounts to about $25 per ton. This amount includes depreciation and interest on the investment.

3,369.54 tons, at $25	$84,238.50
Cost of collecting, handling, assorting, converting to pulp, etc., as shown in plan No. 2	63,095.93
	147,334.43
Value of paper shown above	280,223.90
Net income from sale of 1,748.28 tons of waste paper, as shown in Table No. 3 of plan No. 2	2,608.81
	282,832.71
Less costs as per above	147,334.43
Net proceeds under plan No. 3	135,498.28

The net proceeds of $135,498.28 shown under the above plan contemplate no change in cost of collecting and handling as compared with the present plan. These costs under the present plan as shown by Exhibit A are $32,742.43 against a revenue of $62,527.95, or net proceeds from the sales under the present plan of $29,785.52. The increased proceeds under plan No. 3 over the present plan, therefore, would amount to $105,712.76 annually.

The estimated cost for installation of plant for pulping, manufacturing paper, etc., is placed at a maximum of $600,000. This estimate covers cost of grounds, buildings, necessary machinery, etc.

A preliminary report on the subject of money pulp has been submitted to you under date of September 21, 1912. In this report it was recommended that a plan similar to plan No. 2 be followed. This commission expects within the next two months to submit a final report relative to money-paper pulp.

There is now being erected on the grounds of the Bureau of Standards, to be operated under its supervision, a complete commercial size defibering and deinking machine of the Winestock make. It is anticipated that this machine will be ready for operation during the first week of February, 1913, after which time additional practical tests will be made, and reports relative thereto will be duly submitted.

Respectfully submitte l.

FREDERICK A. CLEVELAND,
WALTER W. WARWICK,
MERRITT O. CHANCE,
Commissioners.

Exhibit A.

Department, office, etc.	Estimated annual quantity.	Cost of collection and handling.	Estimated storage space occupied.	Annual contract price (fiscal year 1912).	Estimated revenue—1911 quantities and 1912 prices.	Method of disposition.
	Tons.		*Square ft.*			
Department of State	10.00	$197.10	None.	.....	.....	Burned.[1]
Department of the Treasury.	[2] 1,560.69	7,051.60	7,665.25	[2]	$13,595.99	Sold baled in an assorted state.
Department of War	148.60	[3] 13.33	565.50	$3.00	445.80	Sold unassorted.
Department of Justice	15.90	342.36	364.00	2.40	38.16	Do.
Post Office Department	400.00	[3] 744.60	682.00	5.30	2,120.00	Do.
Department of the Navy	[4] 41.89	1,544.17	788.64	3.00	[4] 66.72	Do.
Department of the Interior	[5] 259.39	3,792.52	1,756.75	1.50	389.08	Do.
Department of Agriculture	[6] 167.09	3,761.56	778.42	3.00	405.27	Do.
Department of Commerce and Labor.	189.95	2,078.55	[7] 402.00	6.20	1,177.69	Do.[6]
Government Printing Office	[9] 2,588.48	11,209.79	1,190.00	[9]	42,371.48	Sold baled in an assorted state.
Smithsonian Institution	4.00	[10] 296.25	124.00	.....	.....	Burned.
Isthmian Canal Commission	13.70	39.96	100.00	2.00	27.40	Sold unassorted.
District of Columbia	25.03	207.50	[7] 70.00	3.00	75.09	Sold baled in an unassorted state.
Interstate Commerce Commission.	27.00	[11] 27.00	270.00	2.50	67.50	Do.
Pan American Union	12.00	36.14	1,080.00	.....	.....	Given to Salvation Army.
House of Representatives	[12] 93.10	[13]	225.00	[12]	1,271.20	Sold in a limited assorted state.
City post office	[14] 155.73	1,400.00	[7] 72.00	[14]	476.57	
	5,712.55	32,742.43	16,133.56	.....	62,527.95	

[1] Burned because of the confidential nature of the written or printed matter thereon.

[2] This paper is assorted into the following grades and quantities, bringing prices noted:

Tons.	*Per ton.*
336.84 money orders	$22.00
308.15 colored (internal revenue stub books)	12.00
192.80 mixed paper	4.20
18.95 pressboard	5.00
11.91 strawboard and tar board cuttings	4.00
692.04 unassorted	4.00

[3] Does not include portion of salaries of charwomen and messengers.

[4] Paper of United States Naval Observatory burned on premises. Paper of Marine Corps (Paymaster's Department) is collected and disposed of by owners of rented buildings.

[5] In Reclamation Service the waste paper is disposed of by owners of rented buildings

[6] In office of Solicitor the waste paper is burned. In Forest Service the waste paper is disposed of by owners of rented buildings.

[7] Estimated.

[8] In Bureau of Standards the waste paper is destroyed.

[9] This paper is assorted into the following grades and quantities, bringing prices noted:

Tons.	*Per ton.*
76.36 shavings from blanks and blank books	$38.00
357.67 shavings from book papers (white)	32.00
30.90 monotype keyboard paper	30.00
462.65 shavings from book papers (mixed)	14.00
930.92 imperfections from printed paper	18.00
36.46 manila clippings	20.00
97.74 brown wrappers	4.00
341.98 waste sweepings	4.00
193.73 cuttings from strawboard, etc	4.00
60.07 discarded publications	10.00

[10] The cost of hauling to burning place not included.

[11] This amount is cost of baling. Does not include cost of collection or other handling.

[12] This paper is assorted into the following two grades and quantities, bringing prices noted:

Tons.	*Per ton.*
18.20 waste paper	$4.00
74.90 book paper	16.00

[13] No estimate given.

[14] This paper is assorted into the following two grades and quantities, bringing prices noted:

Tons.	*Per ton.*
153.65 waste paper	$3.00
2.08 registered package envelopes	8.00

THE RECOVERY OF FIBER STOCK OF CANCELED PAPER MONEY

THE RECOVERY OF FIBER STOCK OF CANCELED PAPER MONEY.

SEPTEMBER 21, 1912.

The PRESIDENT: The Commission on Economy and Efficiency has under investigation the disposal of the waste paper of the Government and expects to make a full report to you on the subject by the 1st of December.

Among other studies being made are the different processes of deinking and defibering canceled paper money. In connection with the latter we beg to submit at this time a preliminary report prepared by Mr. F. C. Clark of the Bureau of Standards, and a member of our subcommittee on waste paper, relative to the results obtained by a new process of reclaiming waste paper, known as the Winestock process.

As will be noted from this report, Mr. Clark estimates that an annual saving of $100,000 will result by the use of this new process, instead of the present process of macerating and disposing of this stock.

A former investigation was made of this process of defibering and deinking waste paper, by members of this joint committee, at which time, however, studying its application to waste paper generally, of which there are between 5,000 and 6,000 tons accumulated annually by the various services of the Government at Washington.

There is submitted with the report referred to herewith samples of canceled paper money after maceration by the present process, and samples of the macerated paper after being put through the Winestock process.

In order that an idea may be had as to what the Winestock process is, the following brief statement may be of interest:

The machine is of the nature of an open centrifugal pump, so designed and constructed as to produce a remarkably rapid defibering action upon a sheet of paper without injury to the fibers in any way. The rapid and complete defibering of the paper tends to produce a much more rapid chemical action between the ink and those chemicals used to produce saponification. The time required to produce complete saponification and defiber the paper varies from 2 to 10 minutes in a small machine and would not exceed 30 minutes in a large commercial machine. At the end of this time the pulp is ready for washing, and then it is available for remanufacture into paper without the use of any bleaching agents.

The present methods for the recovery of old paper all require cooking from 8 to 16 hours at high pressure and temperature, with a large amount of chemicals, after which time the pulp requires a prolonged washing operation and a high percentage of bleach to produce the desired white color.

The advantages of this new process over the present methods are: Great saving in time, power, labor, chemicals, and a very much higher percentage of yield.

In order that we may further investigate the possible application of this plan and study out other plans which we have under consideration in connection with the subject of making distinctive paper, we find that it will be advisable to have a representative of the Bureau of Standards and a representative of this commission, both members of the joint committee on the subject of paper, visit the mills at Dalton, Mass., where this money paper is manufactured, in order that they may become acquainted with the processes which are now employed. With this in view we would thank you to authorize the Secretary of the Treasury to grant two members of this committee permission to study the processes employed at present in the manufacture of this paper.

Respectfully submitted.

F. A. Cleveland,
W. W. Warwick,
M. O. Chance,
Commissioners.

CANCELED PAPER MONEY.

DEPARTMENT OF COMMERCE AND LABOR,
BUREAU OF STANDARDS,
WASHINGTON.

Mr. M. O. CHANCE,
Secretary the President's Commission on Economy and Efficiency,
White House, Washington, D. C.

SIR: Relative to my recent trip from Newmarket, N. H., to Perkinsville, Vt., and return, I have the honor to report to you through Dr. S. W. Stratton, Director of the Bureau of Standards.

As the railroad connections across New Hampshire are very poor, it was necessary to leave Newmarket, N. H., Monday, August 12, at 7.10 a. m., over the Boston & Maine in order to make the best connections, arriving at Charlestown, N. H., at 12.50 p. m., by way of Manchester, Concord, and Claremont Junction. The ride to Springfield, Vt., was by trolley from Charlestown, N. H., arriving there at 1.30 p. m.

At Springfield I met Mr. G. W. Craigie, who was there to examine the Winestock process in the interests of the S. D. Warren Co., of Cumberland Mills, Me.

Tuesday we were called for by Mr. Winestock, who took us to his experimenta plant at Perkinsville. Later in the morning several New York men arrived. They were Mr. Armstrong, Mr. Auchincloss, and a Mr. Hartman, who represented the firm of George F. Hardy, the well-known consulting engineer and paper-mill architect.

The first test was made on a 10-pound mixture of Saturday Evening Posts, Literary Digests, and the Watchman. The time required to defiber the paper and prepare it for the washing engine was three minutes.

The second test was on macerated United States currency stock, and about 10 minutes were required to completely defiber the small particles of paper contained therein.

For the third run some high-grade machine-finished writing paper, containing 90 per cent of rag, was used. The time required to completely defiber was four minutes.

The last run was made on old printed newspapers and required three and one-half minutes to reduce the paper to pulp.

It was impossible in the short space of time available to thoroughly wash any of these four lots of pulp, so only enough was washed by hand to provide the necessary size samples for those interested. As my previous report covers the work done on all these papers, except the macerated United States currency, this report will deal with the observations made while handling that particular stock.

All of these tests were very much handicapped by water conditions. River water was used, and owing to there being some pink coloring matter in the water from the cotton mills above, also a large amount of decayed vegetable matter due to low water, we were not able to get as good a white color on the pulp as we otherwise would have done.

On Wednesday a second run was made on the United States currency stock. The chemicals used in the run were slightly different from those used in the first run on this kind of stock, and results were more nearly what was required. The color was of a brighter and clearer white than in the previous run. The following table gives the time required to defiber the United States money:

	Began filling machine.	Finished filling machine.	Chemicals in.	End of run.	Total time in minutes.	Time in minutes required to defiber and loosen ink.
	H. m. s.	*H. m. s.*	*H. m. s.*	*H. m.*		
First run	1 31 25	1 32 10	1 32 10	1 41	9½	9
Second run	10 36 50	10 37 50	10 38 00	10 44	7¼	7

The difference between the two runs was due to running a little longer than was thought necessary on the first run in order that the pulp would be thoroughly defibered.

All of Wednesday afternoon and Thursday was spent in washing the pulp and preparing samples for shipment to the Bureau of Standards.

I left Springfield at 5.50 Friday morning, arriving in Newmarket, N. H., at 3 p. m., over the same route as used in going to Springfield.

The results of these runs show very conclusively that the Winestock process will defiber United States currency stock, and also that it will loosen up the ink so that it may be readily removed in the ordinary washing engine. In order to get the best results this process should be substituted for the present method of macerating United States currency in use at the Bureau of Engraving and Printing. The method of the bureau consists in cooking the paper money in a very strong solution of soda ash at about the boiling temperature of water. The vat or kettle in which this is done is provided with a series of revolving knives, which has a more or less grinding action on the pulp. The effect of the grinding action is to shorten the fibers and also to rub the ink or coloring matter into the pores of the fibers, making it more difficult to remove the ink without bleaching. The Winestock process would entirely overcome this defect as well as being a much cheaper method, and the pulp obtained would have a very much higher market value.

It will always be necessary to use some caustic alkali in treating old money paper, as by so doing the silk fiber is destroyed; but were the paper money first put through the Winestock process, then washed, and treated to a weak solution of caustic alkali, the silk would be dissolved and yet the alkali would not be strong enough to weaken the rag fibers. Any weakening of the rag fibers means not only a loss due to deterioration, but an actual loss in weight.

At the present time the Government buys about 500 tons of money paper per year, at a cost of almost $800 per ton. The sale price of macerated money paper is about $31.50 per dry ton, which, together with the loss due to present methods of macerating and cooking, cost of handling, etc., makes the net return practically a negligible quantity. The advantages to be gained by the use of the Winestock process would be as follows:

The recovered pulp would be of a good white color obtained without the use of bleach and could be put upon the market in such shape that an estimated price of about $200 per air-dry ton could be obtained.

This estimated price per ton is based upon the fact that new rags used in making this grade of paper cost about $200 per ton, not adding the cost of reducing the rags to a pulp, which amounts to about $50 per ton.

The pulp produced by the Winestock process is practically ready for use on paper machine. Mills purchasing this pulp would be saving the factory costs in producing pulp from the rags plus the loss in destruction of fibers while so doing.

The stock produced by the Winestock process would be available for making into the highest grade of paper. The cost of handling by this new method would be less than that of the method in use at the present time; also, time required, cost of chemicals and fiber loss would be materially decreased.

The net returns to the Government by the use of the new method would be very large as compared with the returns from the present method. The proposed method would have the following advantages over the present method:

First. Speed in production (saving cost of power and reduction in number of employees).

Second. Decreased loss of fibers, thereby increasing the yield of pulp.

Third. Better grade of fiber, thoroughly removing all ink and dirt, increasing the sale value of pulp over 600 per cent.

The estimated saving over the present method amounts to about $100,000. The first and second items shown under advantages would offset the amount at present received for the pulp.

Respectfully,

F. C. Clark.

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